

# Work as a Source of Livelihood, Not Ill Health: Examining the Status of Occupational Health and Safety in Flower Farms in Central Uganda

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## Abstract

This study examines Occupational Health and Safety implications in flower farms in Central Uganda. An exploratory sequential mixed method design and methodology was employed, with multiple data collection methods including interviews, focus group discussions and survey. The findings show that occupational health and safety issues remain a major problem in flower farms. While the majority of workers agreed that the farms provided them with protective equipment, the data collected from the workers point at either the improper use or ineffectiveness of the equipment. A number of workers reported skin irritations, sore and painful eyes, stiff necks, back pains and occasional headaches that was presumably argued to have arose from their work environment. The study also found that farms have been adjusting in an attempt to correct some of these anomalies. These included the use of biological approaches to control pests and diseases, restricting the use of some chemical formulations that are deemed to be harmful to applicators and environment. Alongside these efforts, the study recommends increased vigilance by the flower farm owners in the provision of personal protective equipment to workers.

## Keywords

Flower Farms, Personal Protective Equipment, Agrochemicals, Rural Communities, Occupational Health and Safety, Chemical Exposures, Workers' Health, Floriculture

## 1. Introduction

Scholarly debates and discourses on flower farming highlight some of the areas where the industry is argued to have transformed development in rural com-

munities (Gezmu, 2013; Mbelwa et al., 2016; Dolan et al., 2003; Kabeer, 2005). Flower growing, as opposed to traditional cash crops (coffee, cotton, tea and sugarcane) is argued to have offered better opportunities to the rural people (Gezmu, 2013; Mbelwa et al., 2016). The harvesting, sorting and packaging of flowers are considered too delicate to be mechanised, and are carried out by people.

The socio-economic impact studies of floriculture industry have, however, suggested that although the industry has shown the capacity to generate jobs, boost foreign exchange, and has enhanced agricultural production technology and skills transfer, it has increasingly come under criticism for multiple sets of problems (Straka, 2008; Mlynska, et al., 2015). Unlike the traditional cash crops, floriculture industry has witnessed a number of occupational health and safety (OHS) issues (Munyuli, 2014). Increased cases of poor occupational health and safety some of which, stem from chemical exposures, poor working positions, overexertion and increased accidents, have been witnessed in flower farms in Ecuador, Ethiopia and Kenya (Tekele & Mengesha, 2006).

The effects of pesticide exposure to workers range from mild cognitive dysfunction through impaired peripheral nervous system function, delayed neuropathy, mood disorders, and psychological distress, to suicides and neurodegenerative diseases (Meriel, 2012).

Apart from the above symptoms, Meriel (2012) argue that high levels of chemicals exposure may result in increased risk of neuropsychiatric outcomes including increased anxiety, depression, and increased agricultural injury because of the depression. Epidemiological studies have associated a number of cancers with some of the main functional classes of pesticides—herbicides, insecticides, fungicides, and fumigants. The increased risk of prostate, colon, lung, rectal, leukaemia, and melanoma cancers, are attributed to pesticides that have the following active ingredients; alachlor, aldicarb, carbaryl, chlorpyrifos, diazinon, S-ethyl-N, N-dipropylthiocarbamate (EPTC), metolachlor, pendimethalin, permethrin, and trifluralin (Alavanja & Bonner, 2012).

Vandana during an interview with Sue (1995), explains a new scenario in Punjab in India. Female feticide (killing female foetuses), something that had never been seen before in India had become common with women in agricultural farms. She argued that the imbalance that was being created in nature was reflected in this new dispensability of the female sex.

It seems Uganda is following this path, as there are a number of reports pointing at health and pollution issues in some of the flower farms in the country (Nakubulwa et al., 2016). These issues depict the growing concern about the potential threats the industry poses to the workers, and community at large.

A number of studies have been carried out on floriculture industry in Uganda. Some of these studies include the industry's huge consumption of fertilisers and pesticides; the country's climatic conditions that favours the production of different types of flowers, sexual harassment, and the failure of the management to

observe OHS in their respective farms (Sunday & Ocen, 2015; Asea & Kaija, 2000; Carla & Jacqueline, 2018; NAPE, 2012; UWEA, 2011). Despite their enormous success in unveiling some of the issues in Uganda's flower farms, these studies did not indulge much on the pressing issues of occupational health and safety of flower farm workers.

Using sustainable rural livelihood framework, this study analyses the status of occupational health and safety in flower farms in central Uganda. The study begins by a simple review of OHS literature from other flower growing countries around the world, and then embarks on the main objective of examining the OHS status in Uganda's flower farms.

## 2. Study Area and Methodology

### 2.1. Study Area

The study was conducted in two flower farms in Wakiso district in Central Uganda. Wakiso District was formerly part of Mpigi District and it came into existence in 2000 when three counties of Mpigi District; Busiro, Kyadondo and Entebbe Municipality were set aside to form a new district. The district due to its proximity to Entebbe airport and a large water body, L. Victoria, hosts more than a half of the total number of flower farms in the country. The two farms include Aurum Roses and Wagagai Ltd.

Aurum Roses was started in 1996 under the name of Harvest International. Initially the farm, like all other flower farms by that time, engaged in only producing hybrid tea roses. Hybrid tea are big-headed roses which were in great demand in Europe and America in early 1990s. The Ugandan farmers after visiting their counterparts in Kenya decided to follow suit by growing these big-headed roses. Kenya's highland region, where majority of farms were located, provided a conducive climate for the growing of the big-headed roses. However, Uganda's lake region climate, as was to be discovered later, did not support that move. After the failure of hybrid tea due to the prevailing warm climate in central region, the farm resorted to producing only sweetheart varieties. With the fluctuating and eventual collapse of sweet heart's global market in late 1990s, the farm readjusted and settled for intermediate varieties that were doing very well by then.

The collapse of the sweetheart's global market and eventual readjustment to bring in intermediate varieties subjected Ugandan farmers to a financial struggle. This, eventually, saw a number of farms closing down or sold off to new proprietors. Harvest International was not spared either. It was taken over by a new proprietor who was of Indian origin. With the new management, its name changed to Aurum Roses. The coming in of the new management saw the farm expanding from 10 ha to about 15 ha. This expansion meant that more jobs were being created for the locals. Another area where change was registered was on the move from timber greenhouses to steel ones, which could withstand annual storms that had devastated flower farms in Uganda.

Wagagai<sup>1</sup> flower farm on the other hand, was supposed to be located at the foot of Mt. Elgon<sup>2</sup> in the Eastern part of Uganda. Due to logistic challenges, one of which was the difficulty in transporting flowers from the foot of Mt. Elgon to Entebbe airport (the only airport that could accommodate large aircrafts), the farm was relocated to Wakiso District in Central Region. It currently seats within Nkumba Parish, Katabi sub-county, Busiro County, six (6) kilometers off Entebbe-Kampala road on the shores of Lake Victoria.

The Company was founded in 1998 and is owned by Dutch investors. The farm started off as a rose farm exporting roses to the Netherlands. With the collapse of sweetheart (small headed) roses, as has been explained above, the farm diversified into propagation of bedding and pot plants. Currently, the farm exports assorted number of unrooted cuttings to Europe, America and is venturing into new market areas in Asia and Japan.

## 2.2. Research Design and Sampling

This study employed a sequential exploratory mixed methods design to examine the status of occupational health and safety in flower farms in Central Uganda. This design necessitated a selection of multilevel samples for qualitative and quantitative components of the study. In the first phase of the study (qualitative phase), purposive sampling technique was used. This technique was preferred because it was deemed the most appropriate for soliciting responses from strategic individuals with expertise and knowledge of the operations of the farm. Such respondents included farm managers, former employees residing in the neighbouring communities, union officials, and community leaders. The purposive sampling strategy yielded a total sample of 10 respondents from the two farms, 15 respondents from the three communities, 5 key informants, and 6 FGDs. A total of 56 respondents participated in the first phase of this study (see **Table A1**).

In the second phase (quantitative phase), involved a larger target group of harvesters, sprayers, packers, and security guards. In this second phase, two techniques were employed, stratified and simple random sampling. Given that workers in flower farms carry out different activities that affect them differently, their views are bound to vary from one department to the other. For instance, harvesters who are dominantly women have very little to say about challenges in spraying, an activity that is explicitly carried out by men. The two techniques were also preferred due to their ability, especially stratified simple random technique, to group the participants alongside their gender. Some scholars argue that when soliciting information from a group of people it is better to separate men from women in order to enhance the ability and willingness of individual participant to speak without being intimidated by the other gender (Byanyima, 2001; Tripp, 2012; Boyd, 1989). It was from this argument that the decision to stratify the workers as men and women was derived. Within the groups, a simple ran-

<sup>1</sup>Wagagai is Mt Elgon's highest peak (point) entirely located on the side of Uganda.

<sup>2</sup>Mt Elgon is an extinct shield volcano on the border of Uganda and Kenya, west of Kitale.

dom sampling technique was applied to select the participants. The list of the workers was acquired from the office of human resources of respective farms. A lottery method was then used to select the respondents. The simple random technique was preferred because there was need to accord an equal opportunity to every group member to participate in the study. The study used Dillman and Salant's three levels of precision table (see **Table A2**) to determine the sample size of 322 workers who participated in this study (Salant & Dillman, 1994).

### 2.3. Data Collection

The data collection methods in qualitative phase included individual in-depth interviews (IDI), key informants' interviews (KII) and focus group discussions (FGDs). The need to use IDI data collection method was to allow the researcher to first contextualise the participants' experiences by letting them describe or narrate, in their own words, their experiences with working in flower farms. According to Chad (2011), exploring the life history of the participants is important because the behaviour of people is only meaningful and understandable when placed in the context of their lives and the lives of those around them. The researcher believes that such contrast would help in drawing a complete picture of what was happening in flower farms.

The researcher also conducted focus group discussions in respective communities. Separate meetings of men and women were held. This was, as has been discussed above, to enhance the ability and willingness of individual participants. Although semi-structured interview guide was employed, some of the questions were rephrased in a particular way or more emphasis was put on certain issues depending on specific local issues that came up during the discussions. Two focus group discussions were held in each of the three communities; Bugiri community hosting Aurum Roses, Bendegere and Nkumba communities hosting Wagagai Ltd. These meetings lasted between one and a half to two hours. The local language, *Luganda*, was used because the majority of the people felt more at ease expressing themselves in Luganda.

To augment the above methods, observation was employed to salvage situations where accurate information could not be solicited by questioning. This was mainly employed in places where the researcher thought that the respondents either were not cooperating or were unaware of the answers. In this study, observation entailed systematic noting and recording events, behaviours, and artefacts (objects) in the farms and in the neighbouring communities. Aspects such as production systems (hydroponics or soil), personal protective equipment (PPE), and disposal sites of used chemical containers were noted. Not to derail the focus of the study, an observation guide was prepared to direct what was to be observed.

In the quantitative phase, a new instrument using the items that were most represented in the qualitative study phase was developed. This followed closely the different themes that had immersed during the qualitative phase. These

themes included pesticides and workers' health, accidents at work, poor working positions, and measures to improve occupational health. These themes served as the major headings for the sections within the instrument.

## 2.4. Data Analysis

Given that the study used both quantitative and qualitative approaches during data collection, analysis also took two different forms. While data analysis process for qualitative phase entailed the use of thematic and content analysis, the quantitative phase used a number of tools. These included descriptive statistics [Mean, Standard Error of Mean (SED), and Standard Deviation (Std. Dev)]; inferential [multiple regression (Mincer's earning function) and t-statistics]; and impact estimation techniques [Propensity Score Matching (PSM)] and the Difference-in-Difference (DiD) methods. Bivariate correlations were calculated to identify significant relationships found across variables in the data (Kleinbaum & Klein, 2002). Non-significant and significant (i.e.  $p$ -values  $< 0.1$ ,  $< 0.5$ ,  $< 0.01$ ) and  $< 0.00$  findings were reported. Separate correlation matrices were made depending on the level of measurement of collected data.

## 3. Results and Discussion

One of the contested issues in flower farms is the health and safety (OHS) of workers. The discussions on the promotion and maintenance of the highest degree of physical, mental and social wellbeing of farm workers has been a concern for decades. This study reports the findings on the prevailing OHS among the flower farm workers in Central Uganda. It also reports ways in which the chemicals and other agro-inputs used in the propagation of flowers have invariably affected the fragile landscapes around Lake Victoria basin. In highlighting these pertinent issues, the study discusses areas where farms have fallen short in the promotion of sound health and safety of flower farm workers.

### 3.1. Agro-Chemical Exposure

In attempting to find out the prevailing OHS in flower farms in Uganda, this study sought to explore the use of pesticides and their effect on both the applicators (sprayers) and green house workers (harvesters). Its focus was to identify and discuss the challenges that the workers were undergoing by working in these farms. One prominent question that came about was whether the general flower farm workers were aware of the dangers of working in such farms. The study then tested the knowledge of the workers on this issue. The variable was measured by asking the workers to state whether they were aware of the danger, they were subjecting themselves into by accepting to work in a flower farm. The following is a response from Grace (not her real name):

“We were not informed about the dangers but as normal human beings we saw what was happening to some of us. Most especially to the sprayers. There are some chemicals they spray against *ebisanyi* (caterpillars). One

day we saw a sprayer come out of the greenhouse dazed like a drunkard and feeling *kamunguluze* (dizziness). He stumbled and fell down gwa (noise made when something falls down), and then he was taken to the hospital. We were later told by those who went with him to hospital that the boy had some bajjaja (spirits) which were disturbing him. We did not believe them but we did not see the boy for some time.”

Grace continued to narrate the problem of chemical exposures and reaction of the management in attempting to cover up some of these incidences.

“When the boy finally came back to work, he told us what exactly happened and even how he was warned by the management not to discuss it with anybody from the farm. With the help of their spies, the office came to know that the boy had told us what happened in the hospital. He was accused of falsely tarnishing the name of the company. First, he was suspended but later sacked.”

From Grace’s narration, some farms attempt to keep their work force ignorant of the dangers they face by working in flower farms. With little knowledge about the danger of pesticides effect on their health, workers ignorantly expose themselves to agrochemicals without taking any precaution. Some former employees also reported this problem during community visits. In one of the visits, Kabasunguzi (not her real name and a former employee who was residing in one of the neighbouring communities):

“It is almost three years since I stopped working in the farm. I worked in the farm for seven years hoping that things would change and life would be better, but it was not easy for me when I became pregnant.”

She then narrated the trend upon which chemical application had taken. They were informed in one of the farm’s meetings that chemical applications will only be done in the morning hours. This was because late evening sprays had been found to spread some diseases. This change of application time meant that every morning some group of workers whose green house was under spray could either work in another house or work outside up to around 10.0 am. From 10.0 am, the workers were expected to be harvesting in their respective houses. Occasionally, as Kabasunguzi narrates below, they could find when the flowers were still wet and the smell of chemicals from the earlier spay was still strong.

“I don’t know whether it has changed but during that time we used to harvest when flowers were still wet. Many of the harvesters used to have skin rashes. One day I fell sick and went to the hospital and the doctor asked me my place of work. Upon answering him, he warned me about flower farms, and then he walked away. Only to be informed later by a nurse who came to attend to me that the child had died in my womb. I felt very bad and decided never to go back to the farm.”

This report points to what Vandana hinted on when discussing the effect of



chemical use in Indian's farms. In an interview with Sue in 1995 Vandana explains this new phenomenon which was being witnessed in Punjab in India.

She argued that the imbalance that was being created in nature by extreme use of pesticides was slowly being reflected in this new dispensability of the female sex. Being a new phenomenon there is little literature talking about it. What Kabasinguzi reported about the death of her infant cannot be easily refuted but needs further study. However, members of the community who had never been employed by the farm also echoed the issue of workers being exposed to chemicals. Kagwa (not his real name, an elder in one of the communities);

“We have seen these boys and girls arrive here and start working in the farm. In the few days I have passed by their houses, I have found them basking in the sun with unceasing fevers that I really think comes from the chemicals they expose themselves to while at work. They are always sick.”

The demand by the flower markets for disease and pest-free flowers has forced the management of these farms to apply pesticides at a larger scale to check the presence and spread of pests and diseases. It is from these frequent chemical applications that flower farm workers come into contact with chemicals either at the time of application or by accessing treated fields without protective gears. Due to these chemical exposures, flower farm workers in Uganda, just like their counterparts in Ecuador report fatigue, anxiety, confusion, and headache (Straka, 2008).

### 3.2. Workers' Perspective on the Prevailing Working Condition

Reports from the qualitative phase suggest that workers did come to contact with agrochemicals in flower farms and as a result, many had experienced some complications. However, the quantitative survey results regarding chemical exposure revealed a different result.

**Table 1** depicts the results of the extent by which the workers were being exposed to agrochemicals in flower farms in Uganda. In comparison with a reference category of Yes or No, NO had a positive coefficient (1.15) with an odds ratio of 3.14 suggesting that the likelihood of flower farm workers coming into contact with chemicals was reduced by 3.14 times. With a *p*-value of ( $p < 0.23$ ) contact with chemicals was significant in measuring the improvement of working conditions in flower farms.

This discrepancy in the results of the two phases with the qualitative phase affirming that flower farm workers were coming into contact with chemicals while the quantitative phase denies it can be explained in a number of ways. Firstly, in the qualitative phase, both active and former employees participated in the study. During community visits, the two groups were interviewed at different times. Community sessions provided the respondents with optimum privacy, making many to air out their views without intimidation. These testimonies were ambiguously missing during farm visits and the subsequent FGDs comprising active workers in the presence of their supervisors. The attempt by the



**Table 1.** Results of the binary logistic regression for the factors associated with the feeling that working condition have improved (Not improved is the RC).

	Coef.	Odds Ratio	Std. Err.	z	p > z
<b>Gender (RC = Male)</b>					
<b>Health problems faced</b>	-0.57	0.57	0.13	-4.49	<b>0.000</b>
Intention to leave (RC = Yes)					
No	1.34	3.80	0.61	2.18	<b>0.029</b>
<b>Contact with chemicals (RC = Yes)</b>					
No	1.15	3.14	0.51	2.27	<b>0.023</b>
Constant	4.02	55.88	1.42	2.84	0.005
LR chi <sup>2</sup> (12) = 53.63					
Prob > chi <sup>2</sup> = 0.0000					

researcher to probe some of these issues in an interview with one of the farm managers received a complete denial:

“Where did you get such information from? We cannot stop you from thinking like that neither can we stop those who are hell-bent to sabotage the good intentions of the farms. You must have gone out to meet some of the enemies of the farm.”

Secondly, during the quantitative phase, questionnaires were administered within the farms capturing views from only active farm employees who were present on that particular day. Respective farms insisted on appointing an individual who walked about with the researcher distributing the questionnaires to the sampled workers. Even though the respondents were advised not to write their names to hide their identity, the privacy was compromised with the presence of the farm guides who were mostly human resource assistants. It is most likely that the respondents might have been careful with their responses lest they be accused of tarnishing their company’s reputation.

Thirdly, it is also worth mentioning that, by the time of this study, farms were experiencing several social, labour and environmental auditing by numerous certification bodies (MPS, Fairtrade, EU, and MAIFF). The coming in of the global market in supervising the sustainability of labour, social relationship and environment in farms might have improved working conditions.

Fourthly, apart from compliancy with standards, farms had also started embracing integrated pest management (IPM) practices. The IPM ushered in the use of predators and other bio-pesticides which were largely less dangerous to neither people nor the environment. The burn of some active ingredients (AI) which have been deemed quite hazardous might have also improved working conditions in flower farms. While the qualitative phase allowed former employees of the farm to participate in the study, the quantitative phase collected data only from those who were still employed by the farms. This group of work-

ers can be argued to have experienced the changes brought about by new adjustments like the compliancy with standards and embracement of IPM practices by the farms. An interview with one of the workers who was working as a scout for pests and diseases revealed that farms were reducing the rampant use of generic chemicals and instead were embracing the new approach of controlling pests biologically.

“We used to have several complaints about sulphur. However, from the time we were told that sulphur kills some of the predators we currently use, the farm stopped bringing it. The use of predators to control some of the common pests reduced our use of chemicals. For this reason, we hardly come into contact with chemicals,” (Dan, not his real name).

Looking at the involvement of the international markets in controlling farms operations coupled with the adjustment in production practices, the researcher then attempted to find out whether these adjustments had improved the working conditions. To capture the views of the workers on this, the variable was measured by asking them to describe the prevailing working conditions. The lead question was, “Do you feel that working conditions in this farm have improved or worsened since you joined?” A summary of the descriptive statistics is given in **Table 2**.

Out of 319 respondents, 284 (89%) of the workers agreed that their working conditions had improved. This finding disagreed with the finding of **NAPE (2012)** which reported that Uganda’s floriculture industry was marred with poor working conditions. NAPE argued that due to this poor working condition the industry had witnessed a number of unrests as workers’ demanded for better pay, proper PPEs, and better working environment. For 89% of the workforce to perceive the change positively suggested that the industry had responded to some of the workers’ demands.

### **3.3. Accidents and Poor Working Positions**

Apart from the chemical exposure, this study also examined some other health-associated issues in line with the activities that were carried out in farms. Several harvesters who participated in the study reported occasional back pain. The daylong bending during harvesting was reported to have caused backache to a number of harvesters. On one of the farms, a harvester who was on crutches narrated the ordeal she had undergone to correct her displaced backbone. By the time of this study, “Joyce” had been in this condition for a period of about six months. Her recovery was not forth coming and because of this, the management had asked her to resign. She had become a liability to the farm, earning salary but not working. During the interview, she said that the farm had no interest in her anymore and had gone ahead to inform the insurance company to work out her compensation. When asked why she could not just accept the compensation and relocate back to the village, Joyce had the following to say:

**Table 2.** Measuring working condition.

	Frequency	Percentage
Improved	284	89.0%
Worsened	35	11.0%

Source: Field Data (2022).

“I have lost almost everything dear to me. My health is deteriorating; my husband could not bear my condition and walked out of our marriage, most probably with another woman. My children! I had to send them back to my mum in the village. The idea of me joining them there will weigh a lot on my old mother. I need this job.”

Further interviews with other harvesters confirmed that bending during harvesting was a major problem as many harvesters reported having experienced, at one given time, a backache. Harvesting is a major activity in flower farms. As opposed to a rose farm where harvested stems are relatively much bigger, harvesting in cuttings farms is carried out quite close to the ground (if they are grown in soil). A harvester bends more than 90 degrees to be able to harvest the cuttings. On some farms, plants are grown on tables. This raises the position from where the harvesting takes place. With the raised beds, the harvester still has to bend but this time only at 90 degrees. Irrespective of the angle upon which one has to bend, 90 or more, the harvesters said the effect was the same and even worse at 90 degrees where they were not fully bending but hanging their upper body with the support of their backbone. After the dislocation of the backbone, one could not be able to bend with ease and was considered a burden to the farm. The backache had forced many harvesters to leave the job (**Figure 1**).

Apart from back pain, some women also reported chest pain. They said that sometimes they were subjected to heavy task for a day. Jane (not her real name) reported that from the time their farm join Fairtrade that demanded for salary raise to all the workers, the task for a day increased. The number of workers was reduced by almost 50%. This meant that one person had to carryout duties that were previously done by two people.

“We were really very happy with Fairtrade for having forced the farm to increase our salaries. In fact, the issue of the salary is now settled; *naye* (but) the work is too much. To complete a day’s task, sometimes we are forced to work up to late in the evening.”

The workers reported that to complete such heavy tasks in time some of them forego both tea and lunch breaks. This has resulted to other complications... Some could carry heavy loads that have left them with chaste pain (see **Figure 2**).

Odong, who was also employed in another flower farms, reported that he normally received a very exhausted wife back home and that was why he was willingly helping her with some of family chores.



**Figure 1.** Harvesting cuttings on soil beds (left) on table beds (right). Source: Field data (2022).



**Figure 2.** A worker carrying a heavy load in order to complete task in time.

“The farm is over working the women down there. These women dig, carry heavy loads, and even if the work is lighter like harvesting, bending the whole day is not an easy task. The only work the women do not do in that farm is spraying.”

Almost every member of the group had something to say.

“As men this is a big problem,” Okwi (not his real name) 33 years old responded, “I have warned my wife twice against this kind of work and more so on late coming. If it is not going to change then I will have no option but to marry a second wife.”

Okwi, an angler, did not support his wife’s decision to work in a flower farm. She went against his wishes when he had gone to one of the Islands in Lake Victoria for a fishing spree. The long work hours as reported above is argued to be bad for people’s health. According to Prasad and Thakur (2019), a person who spends more time in work may experience numerous health problems that may include stress, fatigue, insomnia, and depression. Poor work-life balance results into lack of free time that might strain relationship.

Building and repairing of greenhouses was also reported to have posed some problems to the workers. During the construction of a new house or repairing an old one, workers had to climb as high as five metres above the ground. Workers

reported having witnessed some of their colleagues accidentally falling and breaking their limbs. The victims were given medical treatment and then allowed to recover while carrying light duties. Such duties included cleaning, weeding or taking care of young plants in propagation units. These light duties were not attracting any additional benefits. Apart from salary, some groups of workers were given bonus for work well done. These included harvesting, transporting, scouting, and the likes. During the period when an employee was on light duties, which in most cases were recommended by the hospitals, the employee had to rely solely on her or his monthly salary. Given the inadequacy of the salary, several workers could force themselves back to their normal duties before full recovery.

#### **4. Measures to Improve Occupational Health and Safety in Flower Farms**

The study attempted to find out how farms were addressing issues of OHS in their respective units. During an interview with a safety officer in one of the farms, the researcher was taken through a process that farms had resorted to in order to reduce some of the OHS issues that had haunted the industry for a long time. Explaining the farm's commitment to the observation of workers' health and safety Joshua (not his real name), said that their farm had established safety departments headed by a safety officer. Being a safety officer himself, he had put in place several tools to reduce OHS issues in their farm:

“We have a number of tools in place that have helped us to practically reduce issues of occupational health and safety in this farm. We train the workers, especially the new ones; we engage the management and carryout routine inspections so as to detect where the safety of a worker may be at risk and correct it forthwith.”

He discussed some of these tools in more detail below:

*Tool 1: Training.* All the recruits were inducted for a period not less than one week. During this period, the inductees were taught on issues concerning their safety. These included the dangers of exposing oneself to agrochemicals, how to use PPEs, risky areas to avoid, hygiene and where to seek help in case of accident. This is followed by a periodical sensitization of all employees on these issues once or twice a year.

*Tool 2: Management Commitment.* The safety officer and his or her team constantly inform the management on OHS issues and help develop OHS policies.

*Tool 3: Workers Engagement.* All departments appoint their representatives to the safety committee. The safety officer's duty was to train the committee members who were later entrusted with the training of other members in their respective departments.

Apart from the above tools, the farms had put other measures, which included the periodically issuing of PPEs to the workers, especially to those who were di-

rectly coming into contact with chemicals. Another measure was the observation of re-entry interval in greenhouses where chemicals had been applied. A warning sign at the greenhouse door with the time of spray and time when unprotected personnel could access the area was displayed on the doors. Given that some of the workers might not be able to read the warning notice and accidentally enter treated areas, the management had resorted to also locking the greenhouses (See **Figure 3**). Stephen (not his real name) 47 years old had the following to say:

“The farm is composed of different people with different motives and for this reason; we have resorted to also locking the greenhouses after chemical application. Failure to do that some of these people may come in with cameras only to put the farm in the media claiming that they were forced into a greenhouse which had just been treated with chemicals.” (See **Figure 3**).

The study also found that due to market pressures, farms had resorted to integrated pest management (IPM). This new approach, which was at its initial stage by the time of the study, emphasised the use of both bio-pesticides and bio-fungicides. Some farms had gone a step ahead and were importing predators from Koppert, Real IPM, and Dudutech; these were Kenyan-based suppliers. Responding to the adjustments so far made in the flower farms, one of the managers during the focus group discussion said:

“For sure we have moved we are now using biologicals in controlling pests and diseases. In our last financial year’s audit, the auditors discovered that our pests and disease control has shifted almost 60% from conventional chemicals to biological pesticides.”

He further explained that when a farm is biologically controlling both pests and diseases, there should be no worry that the drift would negatively impact the environment. This is because in biological control the farmer manipulates and uses the biological agents to solve the problems of pests and diseases.

Another attempt by farms to adhere to the safety of workers was also seen on how they monitor the risk of chemical exposure. A mandatory three months’ interval cholinesterase tests were carried out on chemical applicators to find out whether they were being exposed to chemicals. In responding to the issue of chemicals and their effects, Kakuru (not his real name) one of the managers commented:

“We are annually audited on the proper use of chemicals, working conditions, up to the food we give to the workers. The flower farms are currently cleaner than before and for sure it will be better to have flowers on our tables than having tomatoes which are full of class one chemicals.”

To be allowed access in any of these markets, farms were expected to comply with the markets’ requirements.





**Figure 3.** A padlocked Green House and a sprayer in full protective gear. Source: Field data 2020.

“We are not allowed by the market to use more than 9 different active ingredients in one production period.”

This restriction alone has reduced the number of chemicals that might have drifted into the environment. The market constantly monitors this by occasionally measuring the presence of the blacklisted chemicals and the maximum residue levels. A number of products have been confiscated and discarded, with the affected farms denied the opportunity of accessing some of the lucrative markets for a period of time.

When asked why the community and some of the employees who were still working for the farm were not aware of the adjustments which have so far been carried out by the farm, one of the managers responded by saying;

“It is not easy to convey such adjustments even to the workers themselves, they are so negative that they have failed to grasp the farms’ good intentions.”

The above response from Kakuru points to some of the attempts by the market to regulate the use of synthetic chemicals and their social and environmental impacts. Responding to some of these problems, the European Union (EU) consumers, extended their certification programmes to developing countries. A number of certification programs; Milieu Project Sierteelt (MPS ABC)<sup>3</sup>, Milieu Project Sierteelt Good Agricultural Practices (MPS GAP)<sup>4</sup>, Milieu Project Sierteelt Socially Qualified (MPS SQ)<sup>5</sup>, and Fair Trade, were embraced by flower farms in Uganda (Murray, 1998; Yahya, 2007).

<sup>3</sup>MPS-A, B and C are environmental registration certificates. The qualifications MPS-A, -B and -C are awarded to MPS participants who record their usage of crop protection agents, fertilisers, energy and waste over four-week periods. Participants are awarded a qualification four times a year namely MPS-A, B or C based on the total number of points achieved. The qualification MPS-A stands for most environmentally-friendly cultivation, while the qualification participant (D) is awarded when a participant has registered for three successive periods or has registered for 13 periods and scored less than 10 points on the four themes.

<sup>4</sup>MPS-GAP means proven traceability, safety and hygiene of the products. The certification scheme of MPS-GAP is based on GLOBALG.A.P.

<sup>5</sup>MPS-Socially Qualified (SQ) is a certificate that allows growers to demonstrate that their products are cultivated under good working conditions. It includes requirements on health, safety and terms of employment, and is based on universal human rights, the codes of conduct of local representative organisations, and International Labour Organization (ILO) agreements.



Nonetheless, Utting (2002) (as in Opondo, n.d.), argued that the proliferation of codes of conduct in the 1990s did not solve the cases of workers' exploitation and environmental damages. This has prompted some NGOs to denounce the industry's embrace of codes as a mere blue wash, delivering a boost to corporate image and a salve to European consumers but little in the way of improving social and environmental performance in Africa. Morser and Simon (2007) on the other hand argues that the failure of voluntary standards to protect workers in the cut flower industry can be attributed to the absence of unions pressurising companies to adhere to the standards, lack of independent auditing and confusion over which standards to adhere to.

OHS remains a central issue that the flower farm proprietors must address if they are to adhere to the call for the promotion and maintenance of the highest degree of physical, mental and social wellbeing of workers in all occupations, (Tekele & Mengesha, 2006). The use of PPEs as a means of protecting workers from hazardous chemicals is witnessed in the two farms, however, as argued by Alli (2008), PPEs should be considered as the last line of defence after other measures have been taken. According to Garrigoua et al. (2019) other measures that may come before PPEs include the elimination or reduction of the source of danger (e.g., reduction of the use of dangerous products), the reduction of the chances of transmitting danger (e.g., the organisation at work sites), and lastly, if the preceding actions are still insufficient, use of PPEs.

## 5. Conclusion

The above findings suggest that Occupational Health and Safety (OHS) issues remain a major problem in flower farms in Uganda. Despite the efforts so far made by the farms; provision of PPEs, training of the workforce on issues of health, introduction of IPM, adjusting flower beds and many others, workers still pointed out that their health and safety was still at stake. Ill health as a result of chemical exposure, and improper working position might be some of the ways through which flower farms might be increasing the vulnerability of rural people.

The focus on profit maximization by the owners of these farms might be the reason why less effort is being made to improve working conditions in some of these farms. This implies that left alone without being monitored either by the local governments or the markets, the industry can be unsustainable; too dangerous for people to work in. The researcher believes that by pointing at some of these challenges the concerned bodies: the ministry of labour, human rights bodies and workers union might see the need of streamlining the industry by formulating policies that would inform its operations.

## Recommendation and Directions for Future Research

The study recommends that farms should liaise with their hosting communities by creating a channel through the farm and the community may inform each other of the new developments. The study found that farms were putting a lot of efforts to improve the safety of their workers as well as the conservation of the

neighbouring environment. These efforts have gone unnoticed by the community members who have remained doubtful on the operations of the farms. This mistrust can be eliminated if there is proper communication channel that feeds both parties.

In consideration of the rampant use of agrochemicals in these farms there is fear that some of these chemicals may drift into the immediate environment and cause havoc to people and ecosystem. This study, therefore, recommends another study of flower farms in Uganda to find out the level of their environmental compliancy.

### Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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## Appendix

**Table A1.** Total participants in the first phase of the study.

Category of the respondents		Number of Respondents
IDI	Employees from 2 farms: @ 10 respondents	20
	Members from 4 communities: @ 5 respondents	20
KII	Farm managers: 3 from each farm	6
	Community leaders	4
FGD	Community members	6
Total		56

Source: Researchers own plan.

**Table A2.** Sample size needed for population sizes and characteristics.

	Sample size for the 95% confidence level					
	±3% sampling error		±5% sampling error		±10% sampling error	
	50/50 split	80/20 split	50/50 split	80/20 split	50/50 split	80/20 split
100	92	87	80	71	49	38
200	169	155	132	111	65	47
400	291	253	196	153	78	53
600	384	320	234	175	83	56
800	458	369	260	188	86	57
1000	517	406	278	198	88	58
2000	696	509	322	219	92	60
4000	843	584	351	232	94	61
6000	906	613	361	236	95	61
8000	942	629	367	239	95	61
10,000	965	640	370	240	95	61
20,000	1013	661	377	243	96	61
40,000	1040	672	381	244	96	61
100,000	1056	679	383	245	96	61
1,000,000	1066	683	384	246	96	61
1,000,000,000	1067	683	384	246	96	61

Sources: Dillman (2000, 2007), Salant and Dillman (1994).